

Chapter 1 **Proposed Project**

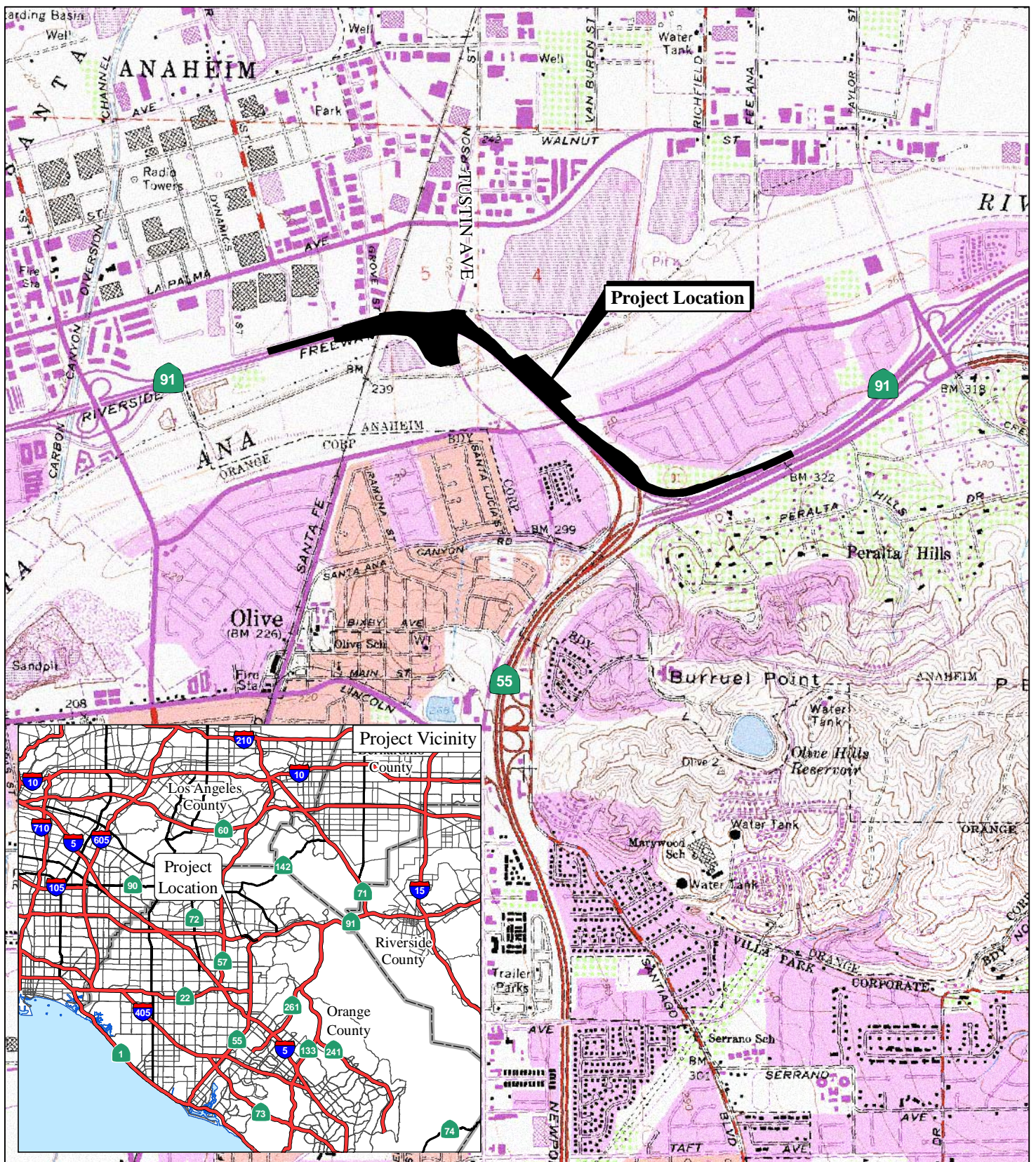
1.1 Introduction

The California Department of Transportation, District 12 (Department) proposes to improve State Route 91 (SR-91) in the City of Anaheim, Orange County by extending a westbound (WB) lane from the northbound (NB) State Route 55 (SR-55)/WB SR-91 connector through the Tustin Avenue Interchange and reconstruct the WB auxiliary lane from east of the NB SR-55/WB SR-91 connector to the Tustin Avenue off-ramp. The proposed project would relieve existing weaving, merging, and diverging deficiencies between the connector and the Tustin Avenue off-ramp. The project limits on SR-91 are from Post Mile [PM] 7.9 to PM 9.5, and the total length of the project is 1.6 miles (mi). The entire project area is located in the City of Anaheim. The Department is the Lead Agency for compliance with the California Environmental Quality Act (CEQA). The regional location of the project and the project vicinity are shown in Figure 1-1.

The proposed project is included in the 2008 Regional Transportation Plan (RTP) prepared by the Southern California Association of Governments (SCAG). The RTP is a long-range plan that identifies multimodal regional transportation needs and investments over the next 25 years in Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura Counties. The proposed project is consistent with the project description in the RTP.

The proposed project is also listed in the Federal Transportation Improvement Program (FTIP). The FTIP is updated every 3 years, and is derived from the RTP which lists specific capital projects proposed within the next 6 years. The project is included in the 2011 FTIP (Project ID ORA000821). The 2011 FTIP lists the following funds for this project: 2010/2011 \$13,577,000, and 2012/2013 \$70,383,000 for a total of \$91,434,000. The page from the 2011 FTIP that cites the proposed project is provided in Appendix E.

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
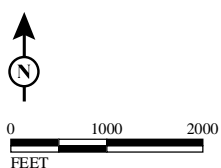
LEGEND
 Project Area

FIGURE 1-1



SOURCE: USGS 7.5' QUAD - ORANGE (81)
 E:\CDT0806A\GIS\Proj_Loc_Fig1_1_ISMND.mxd (11/4/2010)

*Westbound State Route 91 Lane Extension
 and Auxiliary Lane Reconstruction*

Project Location Map

12-ORA-91 PM 7.9/9.5
 Project ID No. 1200000078 (EA# 0C5600)

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1.2 Project Background

SR-91 is a major east-west freeway located in Southern California, extending from Interstate 10 (I-10) in the City of Gardena in Los Angeles County east through Orange County, where it intersects Interstate 5 (I-5), and State Routes 55, 57, and 241. SR-91 extends further northeast beyond the project limits to the City of Riverside in Riverside County. SR-91 accommodates the 91 Express Lanes (FasTrak). The FasTrak is a ten-mile high-occupancy toll road/full tollway combination contained entirely within the median of the SR-91 in Orange County and extends from SR-55 to the Riverside County line. SR-55 is a local north-south freeway located in Orange County, extending from the City of Newport Beach on the south to SR-91 to the north. SR-55 intersects State Route 73 (SR-73), Interstate 405 (I-405), I-5, and State Route 22 (SR-22) and terminates at SR-91 in the City of Anaheim.

The project area lies within the northeastern portion of the City of Anaheim and borders the City of Orange. SR- 91 and SR-55 compose the western and eastern project limits. Within the project limits, on SR-91 there are three general-purpose travel lanes and the continuation of the SR-91 FasTrak lane on SR-91 immediately east of SR-55, approaching the project area. The NB SR-55 to WB SR-91 connector has two lanes that merge into an auxiliary lane on SR-91. The auxiliary lane becomes an exit-only lane to the Tustin Avenue off-ramp. Further west, the continuation of the FasTrak lane becomes a general purpose lane immediately east of the diverge point at the Tustin Avenue off-ramp. Under the Tustin Avenue overcrossing, there are four general-purpose lanes on SR-91. SR-91 crosses the Santa Ana River just east of the Tustin Avenue off-ramp.

The Department and Orange County Transportation Authority (OCTA) are developing freeway improvements to alleviate localized freeway chokepoints. A chokepoint is a location in the freeway system where optimum roadway operation is degraded for a short distance due to unusually heavy weaving or merging vehicle movements. The existing northbound SR-55 to westbound SR-91 connector through the Tustin Avenue interchange is identified as a chokepoint, and potential improvements to alleviate congestion at this chokepoint have been identified in the Department SR-91 Congestion Relief Alternatives Analysis Report (January 2003) and in the OCTA SR-91 Implementation Plan (June 2003).

1.3 Purpose and Need

1.3.1 Project Purpose

The purpose of the proposed project is to reduce existing and future operational problems between the NB SR-55/WB SR-91 connector and the WB Tustin Avenue off-ramp. The proposed project's specific objectives are as follows:

- Improve existing and future mobility and reduce congestion.
- Reduce the existing chokepoint at the NB SR-55/WB SR-91 connector resulting from the lane drop at the Tustin Avenue off-ramp.
- Improve weaving, merging and diverging traffic operations at the NB SR-55/WB SR-91 connector through the Tustin Avenue interchange.







1.3.2 Project Need

The project is needed due to lack of freeway capacity, roadway deficiencies, and to comply with legislative mobility improvement objectives.

The need for this project is based on an assessment of the transportation demand and current and predicted future traffic on SR-91 as measured by level of service (LOS). LOS is based on the ratio of traffic volume to the design capacity of the facility. LOS is expressed as a range from LOS A (free traffic flow with low volumes and high speeds, resulting in low traffic densities) to LOS F (traffic volumes that exceed capacity and result in forced-flow operations at low speeds, resulting in high traffic densities). Table 1.1 provides a description of LOS A through F.

Increasing traffic and extensive weaving, merging, and diverging on the NB SR-55 to WB SR-91 connector have been degrading the LOS within this project segment, particularly during the extended commuter peak hours. The connector has been identified as a chokepoint because the existing configuration presents numerous traffic operational deficiencies that affect LOS.

Table 1.1 Various Levels of Service for Freeways

<div>LEVELS OF SERVICE</div> <div>for Freeways</div>			
Level of Service	Flow Conditions	Operating Speed (mph)	Technical Descriptions
A		70	Highest quality of service. Traffic flows freely with little or no restrictions on speed or maneuverability. No delays
B		70	Traffic is stable and flows freely. The ability to maneuver in traffic is only slightly restricted. No delays
C		67	Few restrictions on speed. Freedom to maneuver is restricted. Drivers must be more careful making lane changes. Minimal delays
D		62	Speeds decline slightly and density increases. Freedom to maneuver is noticeably limited. Minimal delays
E		53	Vehicles are closely spaced, with little room to maneuver. Driver comfort is poor. Significant delays
F		<53	Very congested traffic with traffic jams, especially in areas where vehicles have to merge. Considerable delays

Source: California Department of Transportation Standard Environmental Reference, www.dot.ca.gov/ser/forms.htm.

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1.3.3 Capacity, Transportation Demand, and Safety

SR-91 is the only major transportation facility connecting Orange County and Riverside County. It is also a major link connecting the Los Angeles region with the Inland Empire, and also accommodates interstate traffic. As such, it is heavily used for goods movement, including throughput from the Ports of Los Angeles and Long Beach; commuter traffic between residential developments in the Inland Empire and employment centers in Orange and Los Angeles counties; and interregional traffic, including weekend traffic to Las Vegas and Colorado River destinations.

SR-91 is one of the most heavily congested freeways in Southern California. Normal morning delays begin at 5:00 a.m. and continue through 9:00 a.m., while afternoon delays generally extend between 3:00 p.m. and 7:00 p.m.

SR-55 terminates at SR-91 with two freeway-to-freeway connectors. The first connector, which is from NB SR-55 to WB SR-91, goes over SR-91 and connects with SR-91 traffic from the right. The second connector, from NB SR-55 to eastbound (EB) SR-91, comprises the left three lanes that merge with eastbound SR-91 traffic from the right. The project focuses on the first connector as it merges with the WB SR-91 traffic and weaves with the traffic coming from WB SR-91 trying to exit at Tustin Avenue.

The existing and forecast peak-hour and annual average daily traffic (AADT) data for the freeway mainline along SR-91 in the WB direction is provided below in Table 1.2.

Table 1.2 Mainline Existing and Projected Levels of Peak-Hour and Annual Average Daily Traffic

Westbound	2008			2015			2035		
	AM	PM	AADT	AM	PM	AADT	AM	PM	AADT
At Tustin Avenue	7,619	7,123	113,200	8,080	7,550	120,000	9,370	8,760	139,200

Source: *Traffic Analysis Report*, Caltrans May 2009.

Caltrans = California Department of Transportation

AADT = annual average daily traffic

Based on field observations during the peak periods and the traffic analysis for this project, there is a definite need to relieve congestion and improve operational efficiency on SR-91 from SR-55 to Tustin Avenue. Congested conditions are particularly worse in the WB direction of travel during the a.m. peak period and in the EB direction of travel during the p.m. peak period. As growth continues in Southern

California, and specifically in the Inland Empire, the SR-91 freeway, being the only large transportation corridor that connects Orange County to communities in Riverside and San Bernardino Counties, will become increasingly congested unless capacity enhancements are made or additional corridors are created.

The primary need for the project is based on the heavy existing demand from both SR-55 connector traffic merging onto WB SR-91, and from WB SR-91 traffic exiting to Tustin Avenue. This heavy traffic demand is projected to increase by 2035 within the project area. The increased traffic volumes, in conjunction with the limited capacity of the existing freeway, are expected to result in the deterioration of the LOS along SR-91. The peak-hour and AADT data for ramps/connectors along SR-91 in the vicinity of the project is shown in Table 1.3.

Table 1.3 Ramp Peak-Hour and AADT Volumes

Westbound	2008			2015			2035		
	AM	PM	AADT	AM	PM	AADT	AM	PM	AADT
NB SR-55 connector to WB SR-91	2,843	3,300	38,206	3,010	3,500	40,500	3,500	4,060	47,000
WB off-ramp to Tustin Avenue	1,430	1,370	16,057	1,520	1,450	17,020	1,760	1,690	19,750
WB on-ramp to Tustin Avenue	712	876	10,480	750	930	11,110	880	1,080	12,890
EB off-ramp to Tustin Avenue	908	743	11,540	960	790	12,230	1,120	920	14,200
EB on-ramp to Tustin Avenue	1,084	1,191	12,750	1,150	1,260	13,520	1,340	1,470	15,690

Source: *Traffic Analysis Report*, Caltrans May 2009

AADT = annual average daily traffic

Caltrans = California Department of Transportation

EB = eastbound

NB = northbound

SR-55 = State Route 55

SR-91 = State Route 91

WB = westbound

Based on existing traffic conditions and the Caltrans Highway Design Manual, the average capacity of single-lane on- and off-ramps without an auxiliary lane is approximately 1,500 vehicles per hour. All Tustin Avenue on- and off-ramps that tie into the freeway mainline within the project limits were evaluated for their capacities against their existing volumes. Based on the volumes included in Table 1.3, all existing ramps are within their capacities. However, the WB SR-91 off-ramp to Tustin Avenue is at 1,430 vehicles per hour for the am peak hour, which is close to the average capacity of 1,500 vehicles per hour. Without the project this ramp is projected to increase to 1,760 vehicles per hour in the year 2035 am peak hour.

1.3.3.1 Freeway Analysis

Existing Conditions

Table 1.4 summarizes the existing LOS along the freeway for without project conditions upstream and downstream of Tustin Avenue in the WB direction. Based on the am peak-hour traffic volumes, the table shows that SR-91 in the WB direction operates at LOS E (significant delays) upstream of Tustin Avenue.

Table 1.4 Existing (2008) Freeway Mainline Westbound Level of Service Summary

Peak Hour	Upstream (East of Tustin Avenue)			Downstream (West of Tustin Avenue)		
	Volume	Lanes	LOS (Density–pc/mi/ln)	Volume	Lanes	LOS (Density–pc/mi/ln)
AM	7,619	4	E(36)	6,206	4	D(26)
PM	7,123	4	D(30)	5,193	4	C(21)

Source: *Traffic Analysis Report*, Caltrans May 2009.

Caltrans = California Department of Transportation

Bold = unacceptable LOS

LOS = level of service

pc/mi/ln = passenger cars per mile per lane

Future No Build Conditions

Build Out Year (2015) Conditions

Table 1.5 summarizes the forecast traffic volumes and LOS for the build out year (2015) without project for the WB freeway segment upstream and downstream of Tustin Avenue. The WB freeway segment is forecast to operate at LOS E upstream of Tustin Avenue in the a.m. peak hour.

Table 1.5 Build Out Year (2015) Without Project Forecast Freeway Mainline Westbound Level of Service Summary

Peak Hour	Upstream (East of Tustin Avenue)			Downstream (West of Tustin Avenue)		
	Volume	Lanes	LOS (Density–pc/mi/ln)	Volume	Lanes	LOS (Density–pc/mi/ln)
AM	8,080	4	E(41)	6,580	4	D(28)
PM	7,550	4	D(33)	5,500	4	C(22)

Source: *Traffic Analysis Report*, Caltrans May 2009.

Caltrans = California Department of Transportation

Bold = unacceptable LOS

LOS = level of service

pc/mi/ln = passenger cars per mile per lane

Design Year (2035) Conditions

Table 1.6 summarizes the forecast traffic volumes and LOS for the design year (2035) without project for the WB freeway segment upstream and downstream of Tustin Avenue. The WB freeway segment is forecast to operate at LOS F upstream and LOS E downstream of Tustin Avenue in the a.m. peak hour, and at LOS E upstream of Tustin Avenue in the p.m. peak hour.

Table 1.6 Design Year (2035) Without Project Forecast Freeway Mainline Westbound Level of Service Summary

Peak Hour	Upstream (East of Tustin Avenue)			Downstream (West of Tustin Avenue)		
	Volume	Lanes	LOS (Density– pc/mi/ln)	Volume	Lanes	LOS (Density– pc/mi/ln)
AM	9,370	4	F	7,630	4	E(36)
PM	8,760	4	E(45)	6,390	4	C(26)

Source: *Traffic Analysis Report*, Caltrans May 2009.

Caltrans = California Department of Transportation

Bold = unacceptable LOS

LOS = level of service

pc/mi/ln = passenger cars per mile per lane

1.3.3.2 Intersection Analysis

Existing Conditions

Intersection LOS is based on the average delay experienced by each vehicle that passes through the intersection during peak hour. This is represented by seconds per vehicle (sec/veh). The existing intersection LOS analysis is summarized in Table 1.7. The analysis indicates that all the intersections are currently operating at LOS D or better during peak traffic hours.

Table 1.7 Existing Intersection Level of Service Summary

Intersection	AM Peak		PM Peak	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1. Pacificcenter Drive/Tustin Avenue	C	34	B	20
2. SR-91 WB off-ramp/Tustin Avenue	C	25	D	36
3. SR-91 EB off-ramp/Tustin Avenue	C	33	B	20

Source: *Traffic Analysis Report*, Caltrans May 2009.

Caltrans = California Department of Transportation

EB = eastbound

LOS = level of service

sec/veh= seconds per vehicle

SR-91 = State Route 91

WB = westbound

Future No Build Conditions

Build Out Year (2015) Conditions

Table 1.8 summarizes the intersection LOS forecast for 2015 without the project. Intersection LOS are based on the average delay experienced by each vehicle that passes through the intersection during peak hour. This is represented by sec/veh. The analysis indicates that all the intersections are forecast to operate at LOS D or better during peak traffic hours.

**Table 1.8 Build Out Year (2015) Without Project
Intersection Level of Service Summary**

Intersection	AM Peak		PM Peak	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1. Pacificcenter Drive/Tustin Avenue	D	47	C	27
2. SR-91 WB off-ramp/Tustin Avenue	C	28	D	38
3. SR-91 EB off-ramp/Tustin Avenue	D	39	C	21

Source: *Traffic Analysis Report*, Caltrans May 2009.

Caltrans = California Department of Transportation

EB = eastbound

LOS = level of service

sec/veh= seconds per vehicle

SR-91 = State Route 91

WB = westbound

Design Year (2035) Conditions

Table 1.9 summarizes the intersection LOS forecast for 2035 without the project. Two intersections will operate at an unacceptable LOS E during the a.m. peak hour (Pacificcenter Drive/Tustin Avenue and SR-91 EB off-ramp/Tustin Avenue), and one intersection will operate at an unacceptable LOS E during the p.m. peak hour (SR-91 WB off-ramp/Tustin Avenue). The intersection of SR-91 WB ramps/Tustin Avenue is projected to operate at an acceptable LOS D in the a.m. peak hour, and the intersection of SR-91 EB ramps/Tustin Avenue is projected to operate at an acceptable LOS C in the p.m. peak hour.

**Table 1.9 Design Year (2035) Without Project Intersection
Level of Service Summary**

Intersection	AM Peak		PM Peak	
	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
1. Pacificcenter Drive/Tustin Avenue	E	57	D	47
2. SR-91 WB off-ramp/Tustin Avenue	D	50	E	75
3. SR-91 EB off-ramp/Tustin Avenue	E	57	C	25

Source: *Traffic Analysis Report*, Caltrans May 2009.

Caltrans = California Department of Transportation

EB = eastbound

LOS = level of service

sec/veh= seconds per vehicle

SR-91 = State Route 91

WB = westbound

1.3.3.3 Safety

Traffic Accidents

Transportation System Network–Traffic Accident Surveillance and Analysis System (TSN-TASAS) data for the SR-91 mainline between the NB SR-55 connector and the Tustin Avenue Interchange was analyzed over a 3-year period from July 1, 2005, through June 30, 2008. A total of 226 accidents were reported on WB SR-91 between the NB SR-55 connector and the WB Tustin Avenue on-ramp. Approximately 61.9 percent of these accidents were multivehicle accidents. The accident rate on this segment was 1.04 accidents per million vehicle miles, compared to a statewide average of 1.21. The fatal accident rate on this segment was 0.014 per million vehicle miles compared to the statewide average of 0.012. The combined fatal and injury accident rate was 0.29 per million vehicle miles, compared to the statewide average of 0.37. Additional TSN-TASAS data for segments within the study area was provided by the Department and is summarized in Table 1.10 below.

Table 1.10 Selective Accident Rate Calculations¹

Location	AADT	Actual Rates			Statewide Average ²		
		Fatal Accidents	Fatal + Injury	Total Accidents	Fatal Accidents	Fatal + Injury	Total Accidents
SR-91 WB mainline from PM 7.9 to PM 9.5	123.9	0.014	0.29	1.04	0.012	0.37	1.21
SR-55/SR-91 transition on-ramp from NB SR-55 to WB SR-91	29.7	0.000	0.09	0.58	0.004	0.15	0.45
SR-91/WB off-ramp to Tustin Avenue	17.6	0.000	0.16	0.73	0.004	0.42	1.20
SR-91 WB entrance on-ramp from Tustin Avenue	10.4	0.000	0.35	1.32	0.002	0.26	0.75

Source: California Department of Transportation, Transportation System Network–Traffic Accident Surveillance and Analysis System Database.

Note: In summary, the proposed project should improve the operational characteristics of the interchange and reduce the accident severity and incident rates.

¹ Selective Accident Rate Calculation (July 1, 2005, to June 30, 2008).

² Average rate per million vehicles

AADT = annual average daily traffic

NB = northbound

PM = Post Mile

SR-55 = State Route 55

SR-91 = State Route 91

WB = westbound

TSN-TASAS data has indicated the following:

- Although the total accident rate on the freeway mainline is lower than the statewide average, the freeway mainline has a slightly higher rate of fatal accidents than the statewide average.

- The total accident rates for on-ramps from Tustin Avenue and from SR-55 NB are higher than the statewide averages. However, the fatal accident rate is less than the statewide average.
- The SR-91 mainline, the transition road from SR-55 NB/SR-91 WB, and the SR-91 WB off-ramp to Tustin Avenue have lower injury accident rates than the statewide average.
- The SR-91 WB entrance on-ramp from Tustin Avenue has a higher injury accident rate than the statewide average.
- The total accident rate is lower than the statewide average on the freeway mainline, but exceeds the statewide average for the transition road from SR-55 NB to SR-91 WB and the SR-91 WB entrance on-ramp from Tustin Avenue.

Table 1.11, below, summarizes the types of accidents within the study area.

Table 1.11 Accidents Within Study Area¹

	Total Accidents	Injury Accidents	Fatal Accidents	Type of Accident				
				Side swipe	Rear- End	Broadside	Hit Object Other Than Vehicle	Other
SR-91 WB mainline from PM 7.9 to PM 9.5	226	61	3	65	96	1	57	7
SR-55/SR-91 transition on- ramp from NB SR-55 to WB SR-91	19	3	0	1	8	0	10	0
SR-91/WB off- ramp to Tustin Avenue	14	3	0	1	10	3	0	0
SR-91 WB entrance on- ramp from Tustin Avenue	15	4	0	3	7	1	4	0

Source: California Department of Transportation, Transportation System Network–Traffic Accident Surveillance and Analysis System Database.

¹ Selective Accident Rate Calculation (July 1, 2005, to June 30, 2008).

NB = northbound

PM = Post Mile

SR-55 = State Route 55

SR-91 = State Route 91

WB = westbound

1.3.4 Roadway Deficiencies

Currently, within the project limits along SR-91, there are five general-purpose lanes before the NB SR-55/WB SR-91 connector, four lanes through the SR-91/Tustin Avenue interchange, and five general-purpose lanes after the SR-91/Tustin Avenue WB on-ramp. Therefore, the SR-91 WB freeway segment between SR-55 and the Tustin Avenue overcrossing is identified as a chokepoint and presents numerous traffic operational deficiencies such as lane weaving and ramp merging/diverging.

In addition, heavy traffic volumes exist on the NB SR-55/WB SR-91 connector during both the a.m. and the p.m. peak hours. Since two lanes of the connector merge into one, motorists must shift from the connector to the freeway mainline, resulting in conflicting merging movements.

1.3.4.1 Lane Weaving and Ramp Merge/Diverge

Conflicting merging movements occur when the traffic in the trap (exit-only) lane of the SR-55 connector is merging onto the freeway (SR-91) while the traffic from the freeway is merging onto the trap (exit-only) lane to exit at Tustin Avenue. SR-91 drops one WB general-purpose lane at the SR-55/SR-91 connector, and traffic on SR-91 needs to merge prior to the mainline before the Tustin Avenue overcrossing. Table 1.12 summarizes the weaving LOS in the WB direction along SR-91 between the SR-55 connector and Tustin Avenue. As shown in Table 1.12, the section of freeway (WB direction along SR-91) between the SR-55 connector and Tustin Avenue operates at LOS F in both the a.m. and p.m. peak hours for the existing, build out year (2015) and future design year (2035) scenarios.

Table 1.12 Freeway Weaving Levels of Service

Alternatives	AM LOS (Density) ¹	PM LOS (Density) ¹
Existing 2008	F (47)	F (44)
No Build 2015	F (50)	F (48)
No Build 2035	F (61)	F (58)

Source: *Traffic Analysis Report*, Caltrans May 2009.

¹ The LOS for weaving is defined based on densities in terms of passenger cars per mile per lane.

Caltrans = California Department of Transportation

LOS = level of service

1.3.5 Social Demands or Economic Development

A review of the growth projections adopted by SCAG indicates continuing growth in the region that the proposed project serves. The population in Orange County is expected to increase from 2.8 million in 2000 to over 3.6 million in 2035, an increase

of nearly 29 percent. This regional growth will continue to place demand on SR-91. Growth in Riverside County is projected to increase at a faster pace. The population in Riverside County is projected to increase from 1.5 million in 2000 (United States Census Bureau 2000) to 3.6 million in 2035 (Riverside County Center for Demographic Research 2006), an increase of 140 percent. This regional growth will continue to place a high demand on SR-91, since many residents of Riverside County use this freeway to commute to jobs in Orange and Los Angeles Counties.

1.3.6 Legislation

As part of the OCTA Freeway Chokepoint Program, freeway improvements were identified to alleviate localized freeway chokepoints. Funds for these projects were allocated from the Regional Improvement Program (RIP). The RIP is a State funding category created by Senate Bill (SB) 45 that can be used for a variety of projects, including for freeways, carpool lanes, rail lines, transit stations and road rehabilitation. RIP funds become part of a funding program known as the Federal Transportation Improvement Program (FTIP).

1.3.7 Modal Interrelationships and System Linkages

SR-91, a major east-west regional facility in Orange County, provides the City of Anaheim with direct access to the Cities of Buena Park, Fullerton, Placentia, Orange, and Yorba Linda and the Counties of Los Angeles, Riverside, and San Bernardino. SR-91 also provides direct access to major north-south corridors, specifically SR-55, SR-57, and I-5 to the west and SR-241 to the east. SR-91 also provides a route for the movement of goods and people between the Inland Empire and the Ports of Long Beach and Los Angeles, Los Angeles International Airport (LAX), John Wayne Airport (SNA) in Orange County, and Ontario International Airport (ONT) in San Bernardino County.

SR-55 is an 18 mi long, north-south transportation facility that provides the City of Anaheim with direct access to the central Orange County cities, including the Beach Cities. SR-55 is the primary transportation facility that connects job centers in the Cities of Irvine, Santa Ana, and Costa Mesa to SR-91, which leads to commuter communities in the Inland Empire and other places northeast of Orange County. SR-55 bisects I-405, I-5, and SR-22, and terminates at SR-91 in the City of Anaheim.

The project site and vicinity are served by OCTA and Metrolink. OCTA provides local bus routes throughout the study area. In addition, OCTA has a shared-ride service for people who are unable to use the regular, fixed-route bus service because

of functional limitations caused by a disability. Also, OCTA has a Senior Mobility Program (SMP) that is designed to fill the gap between local fixed-route buses and an Americans with Disabilities Act (ADA) paratransit service or ACCESS service by providing local transportation service to seniors in participating cities in Orange County.

Metrolink is a commuter rail line that provides service to and from the City of Anaheim and other areas, including downtown Los Angeles, Riverside, and several locations in Orange County. Metrolink is operated by the Southern California Regional Rail Authority (SCRRA), which provides transit services to the Counties of Orange, San Bernardino, Ventura, Riverside, San Diego, and Los Angeles. There is an existing Metrolink station (Anaheim Canyon) approximately 0.25 mile from SR-91 on La Palma Avenue, east of Tustin Avenue.

1.3.8 Air Quality Improvements

According to the City of Anaheim's General Plan, the Commuter Services Office was established as part of the Public Works Department in 1989 to help facilitate federal and State Clean Air Act requirements. The Commuter Services Office offers a variety of information for City of Anaheim employees interested in bicycling, carpooling, vanpooling, and public transit, including bus and rail transportation opportunities.

1.3.8.1 Transportation Control Measures

Transportation Control Measures (TCM) strive to maximize the efficiency of the existing system by providing options such as public transportation, HOV lanes, ramp metering, bike lanes, park and ride facilities. Such measures act as options improve traffic flow, decrease the number of vehicle trips, and provide areas to promoting vehicle rideshare without altering the number of through lanes.

Existing public transportation options within the project limits via bus include, but are not limited to: Bus Route 213 A - this route provides 4 trips each morning and afternoon peak hour period from Brea to Irvine; Bus Routes 24, 71, and 167 operate along Tustin Avenue and intersect SR-91; Bus Route 38 on La Palma Avenue from the Metrolink station east to just past Lakeview Avenue and west to the City of La Palma; Bus Route 411 on La Palma Avenue from the Metrolink station east to Anaheim Hills; Bus Route 131 on Lakeview from Rose Drive to Yorba Linda Boulevard. Public transportation also includes local taxi companies and access available on a dial-a-ride-type basis for handicapped riders.

Currently, there are four park-and-ride facilities for people who carpool or use public transportation in the City of Anaheim. The nearest park-and-ride facility is identified as Camelot Golfland, located at La Palma Avenue and North Shepard Street. Camelot Golfland has 50 available parking spots and is located approximately 1.2 mi northwest of the western project limits.

High-occupancy vehicle (HOV) lanes are present within the project area. The HOV lanes are located at the western most part of the project limits approximately 0.25 mile west of the Tustin Avenue Interchange.

1.3.8.2 Transportation Demand Management

Transportation Demand Management (TDM) focuses on the demand side of travel behavior, with regional strategies for reducing the number of vehicle trips and vehicle miles traveled and increasing vehicle occupancy. It facilitates higher vehicle occupancy or reduces traffic congestion by expanding the traveler's transportation choices through initiatives such as telecommuting and changing work schedules to produce a more even pattern of transportation network use, thereby muting the effect of morning and evening rush hours.

OCTA also subsidizes a vanpooling program, which provides 11 routes to and from inland cities during the morning and evening commute. Participants in the vanpooling program have the option of joining as part-time or full-time riders and pay rates in relation to the distance traveled.

1.4 Project Description

This section describes the proposed project and the design alternatives that were developed by a multidisciplinary team to achieve the project purpose and meet the need while avoiding or minimizing environmental impacts. The project alternatives are Alternative 1 (No Build Alternative), and build alternatives; Alternative 2 and Alternative 3.

The project is located in the City of Anaheim, Orange County, on SR-91 from east of the NB SR-55/WB SR-91 connector through the Tustin Avenue interchange. The project limits on SR-91 are from PM 7.9 to PM 9.5 and the total project length is 1.6 mi. The existing lane configurations by section within the project limits are shown in Table 1.13.

Table 1.13 Current Lane Configuration Along NB SR-55 and WB SR-91 Within Project Limits

Westbound SR-91 Section	Lane Configuration
SR-55 to Tustin Avenue	Three general-purpose lanes and one toll HOV lane.
Connector from NB SR-55	Two general-purpose lanes.
Tustin Avenue SR-91 on-ramp	One lane.
Tustin Avenue overcrossing	Three through lanes.
SR-91 under Tustin Avenue overcrossing	Four general-purpose lanes.
Tustin Avenue SR-91 off-ramp	One lane splits into two right-turn lanes and one left-turn lane.

Source: *Traffic Analysis Report*, Caltrans May 2009.

Note: General-purpose lane = a mainline freeway lane open to all traffic

Caltrans = California Department of Transportation

HOV = high-occupancy lane

SR-55 = State Route 55

SR-91 = State Route 91

NB = northbound

WB = westbound

The purpose of the project is to improve local circulation by eliminating extensive weaving, merging and diverging issues that result in the chokepoint at the NB SR-55/WB SR-91 connector, including the Tustin Avenue interchange. Construction for this project is expected to start in the spring of 2013 and be completed in the fall of 2015.

1.5 Alternatives

1.5.1 No Build Alternative (Alternative 1)

The No Build Alternative would not include any improvements to the NB SR-55/WB SR-91 connector and the Tustin Avenue ramps. Under the existing configuration, vehicles traveling on the NB SR-55/WB SR-91 connector (existing of two lanes merge into one single auxiliary lane), must exit at the Tustin Avenue off-ramp. While this alternative is used as the baseline for comparison of the Build Alternatives, it does not address the existing weaving and merging deficiencies, and does not meet the project purpose and need.

Under the No Build Alternative, the project segment of SR-91 would continue to operate over capacity and serve as a two-lane connector that merges to one lane at the connector terminus near the Riverdale Avenue overcrossing. Under the No Build Alternative, it is expected that through 2035, traffic weaving and merging deficiencies would continue to worsen if no freeway operational improvements are implemented within the project area.

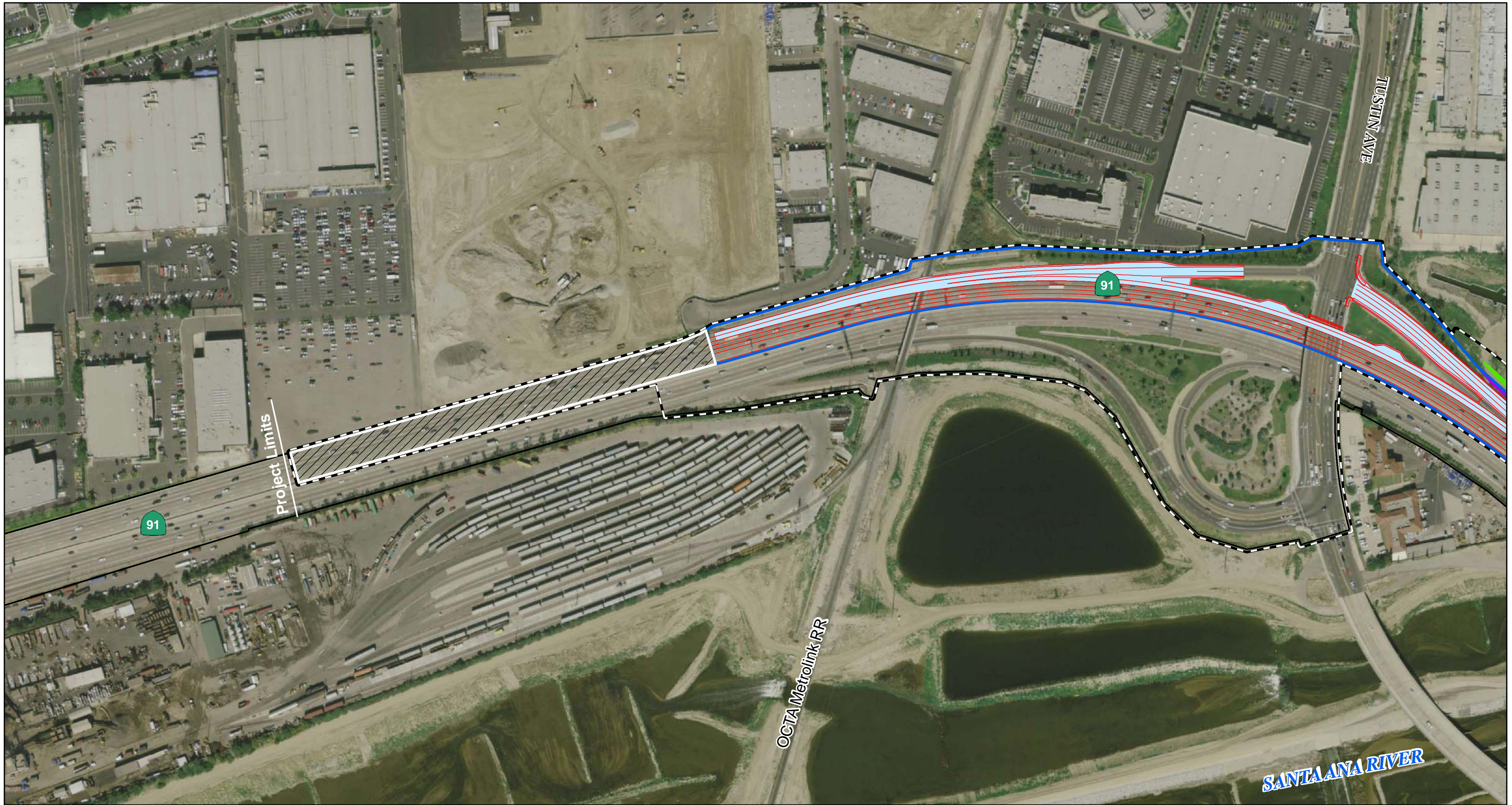
1.5.2 Build Alternative 2

Alternative 2 would modify the existing configuration by extending the inside lane from the NB SR-55/WB SR-91 connector through the Tustin Avenue interchange, and join the existing general-purpose lane to the west of the Tustin Avenue on-ramp. The outside lane would continue to serve as an auxiliary lane and drop at the Tustin Avenue off-ramp. Some weaving would still occur; however, the extended inside lane would improve the weaving efficiency. The proposed improvements under Alternative 2 are described in detail in Section 1.5.5.1, Unique Features of the Build Alternatives and are shown on Figure 1-2.

1.5.3 Build Alternative 3

Alternative 3 would also modify the exiting configuration by extending the existing two connector lanes from the NB SR-55/WB SR-91 connector. Both lanes will be extended to east of the Tustin Avenue Overcrossing, where they would merge into one lane, continue through the Tustin Avenue interchange and join the existing general-purpose lane to the west of the Tustin Avenue on-ramp. Prior to the merge, the outside lane would provide exit access to the Tustin Avenue off-ramp. In addition, this alternative would further reduce weaving between the NB SR-55/WB SR-91 connector and the Tustin Avenue interchange by providing a WB auxiliary lane beginning east of the SR-55/SR-91 Interchange, bypass around the NB SR-91/WB SR-91 connector and exit at the Tustin Avenue off-ramp. The proposed improvements under Alternative 3 are described in detail in Section 1.5.5.2, Unique Features of the Build Alternatives and are shown in Figure 1-3.

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LEGEND



Project Area



Additional Permanent Easement



Additional Right of Way Aquisitions



Physical Construction Limit



Temporary Construction for signing and Striping



Temporary Construction Easement



Existing Right-of-Way



Striping Areas



Alternative 2 Improvement Area



Alternative 2 Restriping for Improvements



Existing Soundwall

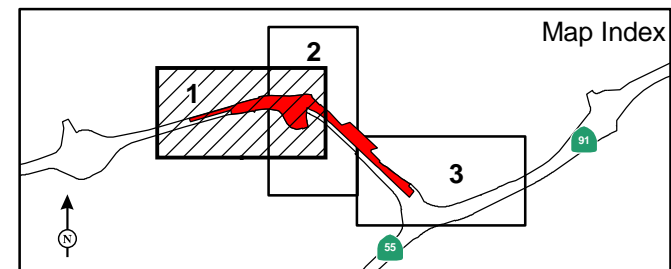


FIGURE 1-2
Sheet 1 of 3

Westbound State Route 91 Lane Extension
and Auxiliary Lane Reconstruction
Alternative 2 Project Features
12-ORA-91 PM 7.9/9.5
Project ID No. 1200000078 (EA# 0C5600)

SOURCE: Digital Globe (2008), RBF (05/2009)

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LEGEND



Project Area



Additional Permanent Easement



Additional Right of Way Aquisitions



Physical Construction Limit



Temporary Construction for signing and Striping



Temporary Construction Easement



Existing Right-of-Way



Striping Areas



Alternative 2 Improvement Area



Alternative 2 Restriping for Improvements



Existing Soundwall



0 125 250
FEET

SOURCE: Digital Globe (2008), RBF (05/2009)

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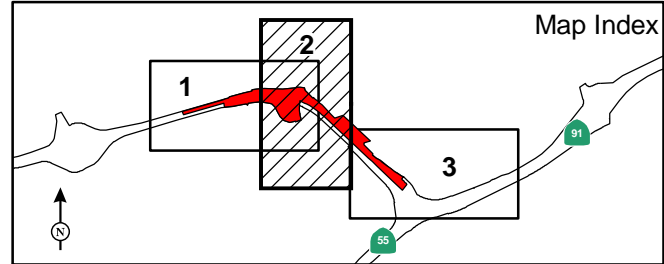
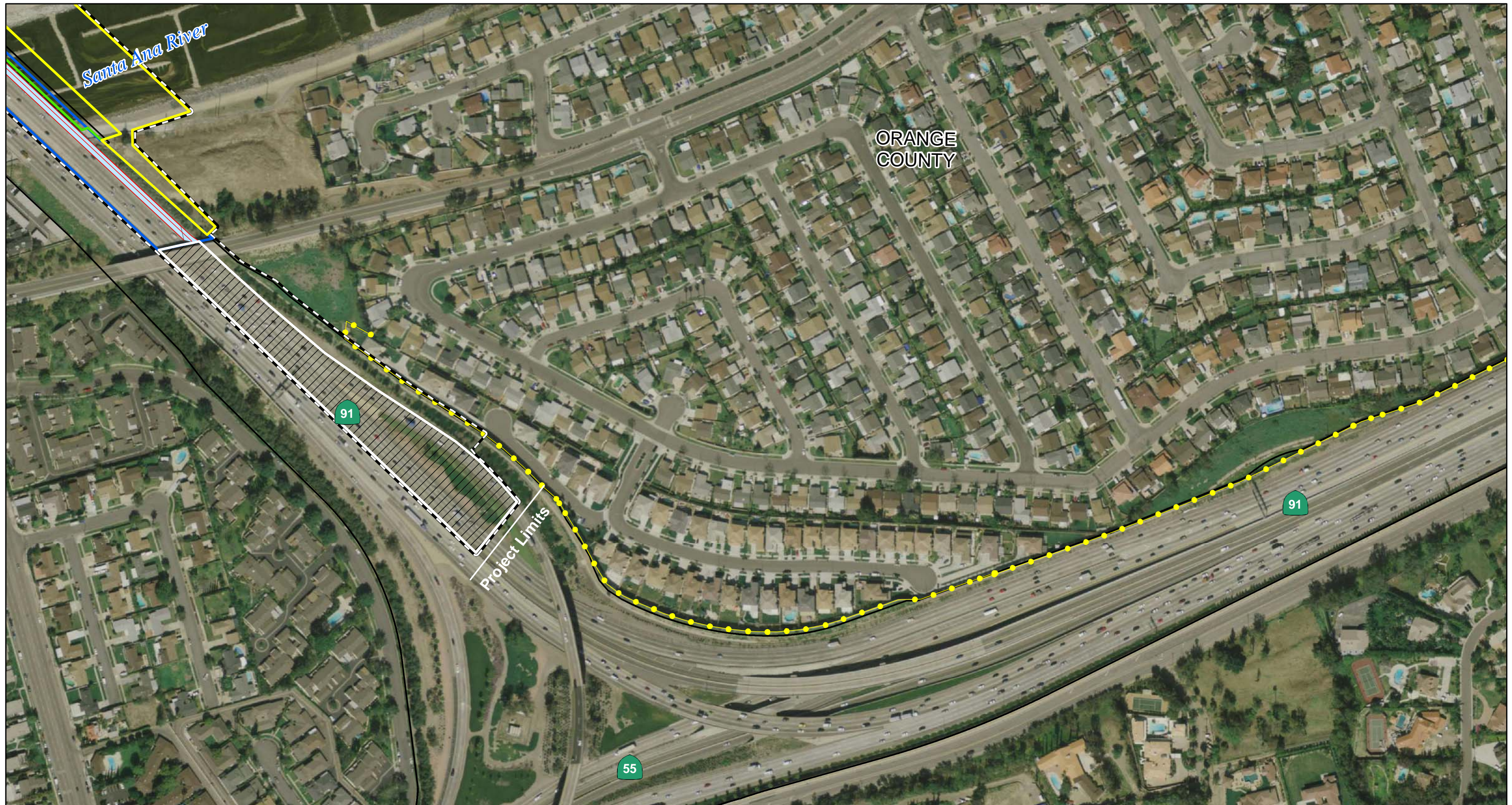













FIGURE 1-2
Sheet 2 of 3

Westbound State Route 91 Lane Extension
and Auxiliary Lane Reconstruction
Alternative 2 Project Features
12-ORA-91 PM 7.9/9.5
Project ID No. 1200000078 (EA# 0C5600)

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LEGEND

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|---|---|
|  Project Area |  Existing Right-of-Way |
|  Additional Permanent Easement |  Striping Areas |
|  Additional Right of Way Aquisitions |  Alternative 2 Improvement Area |
|  Physical Construction Limit |  Alternative 2 Restriping for Improvements |
|  Temporary Construction for signing and Striping |  Existing Soundwall |
|  Temporary Construction Easement | |



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SOURCE: Digital Globe (2008), RBF (05/2009)

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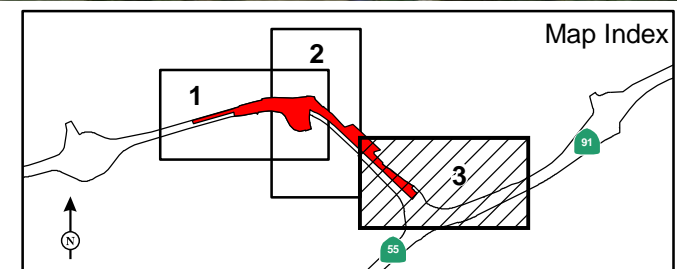
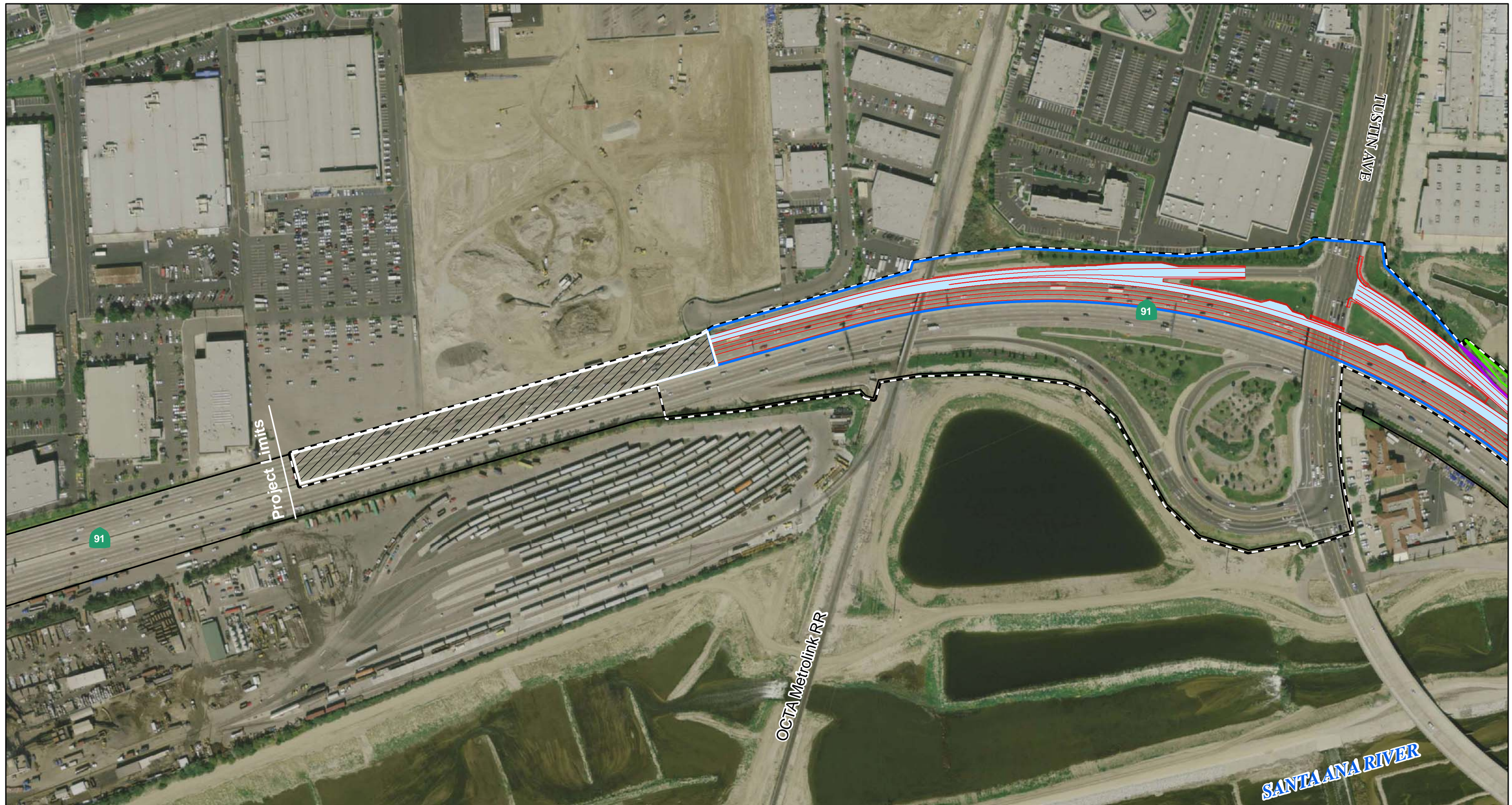


FIGURE 1-2
Sheet 3 of 3

*Westbound State Route 91 Lane Extension
and Auxiliary Lane Reconstruction*
Alternative 2 Project Features
12-ORA-91 PM 7.9/9.5
Project ID No. 1200000078 (EA# 0C5600)

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LEGEND

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|--|---|--|---|
| | Project Area | | Existing Right-of-Way |
| | Additional Permanent Easement | | Striping Areas |
| | Additional Right of Way Aquisitions | | Alternative 3 Improvement Area |
| | Physical Construction Limit | | Alternative 3 Restriping for Improvements |
| | Temporary Construction for Signing and Striping | | Existing Soundwall |
| | Temporary Construction Easement | | |



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SOURCE: Digital Globe (2008), RBF (05/2009)

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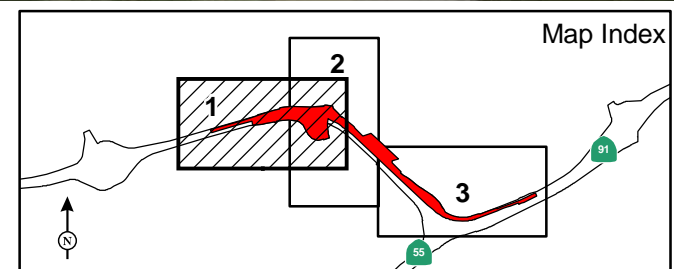


FIGURE 1-3
Sheet 1 of 3

Westbound State Route 91 Lane Extension
and Auxiliary Lane Reconstruction
Alternative 3 Project Features
12-ORA-91 PM 7.9/9.5
Project ID No. 1200000078 (EA# 0C5600)

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LEGEND



Project Area



Additional Permanent Easement



Additional Right of Way Aquisitions



Physical Construction Limit



Temporary Construction for Signing and Striping



Temporary Construction Easement



Existing Right-of-Way



Striping Areas



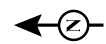
Alternative 3 Improvement Area



Alternative 3 Restriping for Improvements



Existing Soundwall



0 125 250
FEET

SOURCE: Digital Globe (2008), RBF (05/2009)

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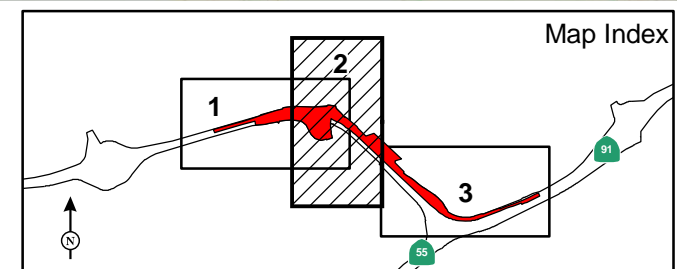


FIGURE 1-3

Sheet 2 of 3

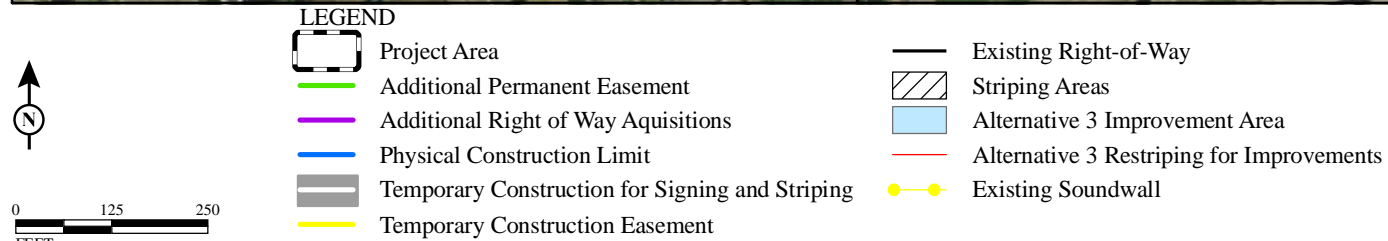
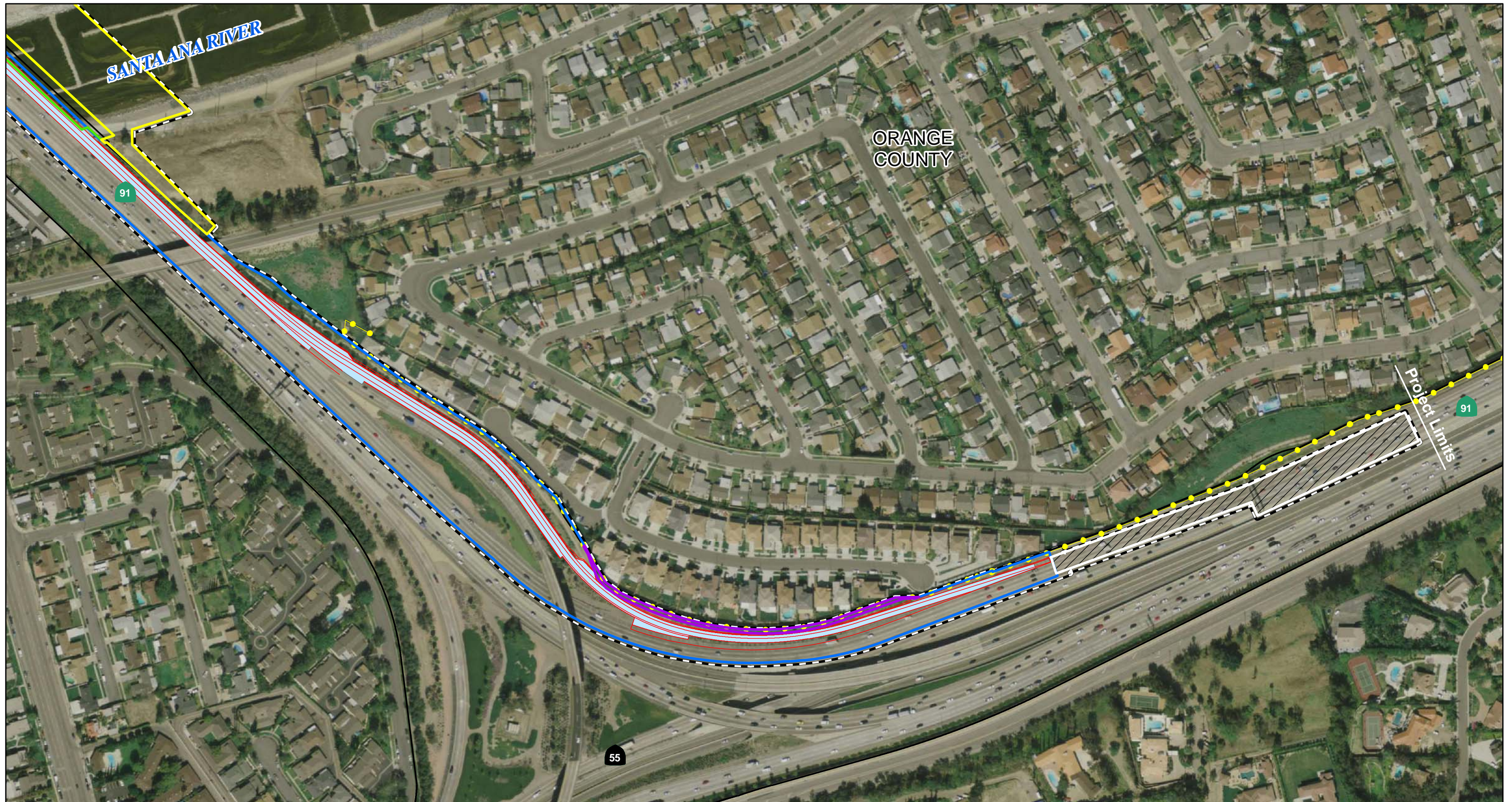
Westbound State Route 91 Lane Extension
and Auxiliary Lane Reconstruction

Alternative 3 Project Features

12-ORA-91 PM 7.9/9.5

Project ID No. 1200000078 (EA# 0C5600)

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SOURCE: Digital Globe (2008), RBF (05/2009)
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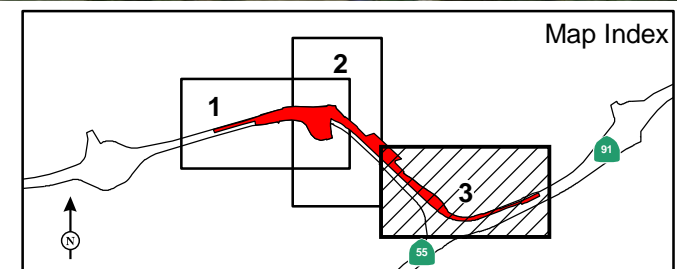


FIGURE 1-3
 Sheet 3 of 3

*Westbound State Route 91 Lane Extension
 and Auxiliary Lane Reconstruction*
 Alternative 3 Project Features
 12-ORA-91 PM 7.9/9.5
 Project ID No. 1200000078 (EA# 0C5600)

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1.5.4 Common Design Features of the Build Alternatives

The project features are shown on Figures 1-2 (Alternative 2) and 1-3 (Alternative 3). The following project features are common design elements for both Build Alternatives:

- Widening of the SR-91 Santa Ana River Bridge over the Santa Ana River (Alternative 2 would require the Santa Ana River Bridge to be widened to accommodate one additional lane. Alternative 3 would require the Santa Ana River Bridge to be widened to accommodate two additional lanes).
- Extension of general purpose lane(s) from the NB SR-55/WB SR-91 connector through Tustin Avenue (Alternative 2 would extend one general purpose lane and Alternative 3 would extend two general purpose lanes).
- The existing WB one-lane Tustin Avenue exit off-ramp would be reconfigured to a two-lane exit ramp.
- Realignment of the WB SR-91 Tustin Avenue off- and on-ramps.

1.5.4.1 Relocation of Utilities

Within the footprints for the Build Alternatives, there are existing utility lines. All existing utilities within Department ROW would be protected in place or relocated within the project limits during construction of the project. Any utility lines outside the Department ROW but within the project footprint would be protected in place or relocated in coordination with the respective utility companies. All other impacted utilities outside Department ROW will be protected in place.

1.5.4.2 Electrical Systems

Alternatives 2 and 3 would include the relocation of existing electrical systems such as relocation of lighting along the ramps, street lighting conduits, traffic signal conduits, and fiber optics.

1.5.4.3 Signing

Under the Build Alternatives one overhead sign structure at Pier 15 on the existing deck of the Santa Ana River Bridge will be replaced.

1.5.4.4 Replacement Planting and Irrigation Modification

Existing landscaping and irrigation systems removed during roadway construction will be replaced. Replacement plantings will be implemented under a separate construction contract following construction of the proposed roadway project. Irrigation modification work will be included as part of the roadway contract.

1.5.4.5 Drainage

Under both Build Alternatives, storm drain improvements would include relocating approximately eight existing inlets and modifying the 18-inch reinforced concrete pipe (RCP) storm drain that connects to the inlets. The project's drainage design will require permanent treatment best management practices (BMPs). Department-approved Treatment BMPs, which could be incorporated into the project include but are not limited to, biofiltration swales, biofiltration strips, infiltration trenches, and detention basins.

1.5.4.6 Right-of-Way Acquisition

There are no full property acquisitions, displacements, or relocations under Build Alternatives 2 and 3. However, partial acquisitions, temporary construction easements (TCEs), and permanent construction easements (PCEs) would be required in various locations of the project, including the Santa Ana River. Both Build Alternatives would require 4 TCEs and 3 PCEs. However, Alternative 2 would require 1 partial acquisition, and Alternative 3 would require 16 partial acquisitions.

Construction Vehicle Access and Material Staging

Construction vehicle access and staging of construction materials would occur within disturbed or developed areas inside the existing ROW and off-site staging areas. Vehicle access and materials staging during construction of walls adjacent to Department ROW would occur in approved designated areas. All construction vehicle access, materials staging and storage, and other construction activities would occur within the defined disturbance limits for the project.

Construction Lighting

The project would require nighttime construction activities in some parts of the project area. Portable equipment would be used to light up the work areas. If work is done at night, lighting would be directed away from adjacent land uses.

1.5.4.7 Retaining Walls

A retaining wall would be constructed at the north abutments beneath the Tustin Avenue overcrossing bridge structure.

1.5.5 Unique Features of the Build Alternatives

1.5.5.1 Build Alternative 2

The unique features of Alternative 2 are described in detail below and are shown on Figure 1-2.

Riverdale Avenue Overcrossing

No modifications are proposed to the overcrossing under Alternative 2.

1.5.5.2 Build Alternative 3

The unique features of Alternative 3 are described in detail below and are shown in Figure 1-3.

- Provide a WB auxiliary lane beginning east of the SR-55/SR-91 Interchange, bypass around the NB SR-91/WB SR-91 connector, and exit at the Tustin Avenue off-ramp.

Riverdale Avenue Overcrossing

Under Alternative 3 a retaining wall is proposed at the north abutment beneath the Riverdale Avenue overcrossing.

1.5.6 Comparison of Alternatives

Table 1.14 provides a comparison of the No Build (Alternative 1), Alternative 2, and Alternative 3.

Table 1.14 Comparison of Alternatives and Impacts

Evaluation Criteria	No Build Alternative (Alternative 1)	Alternative 2	Alternative 3
Relocations	<ul style="list-style-type: none"> • No property acquisitions or relocations would occur. 	<ul style="list-style-type: none"> • 1 partial acquisition 4 TCEs, and 3 PCEs. • No relocations are required. 	<ul style="list-style-type: none"> • 16 partial acquisitions and 4 TCEs, and 3 permanent construction easements. • No relocations are required.
Traffic and Transportation/ Pedestrian and Bicycle Facilities	<p>Operation</p> <ul style="list-style-type: none"> • No improvements at the existing NB SR-55 to WB SR-91 connector. Increase in excessive traffic weaving and merging movements. <p>LOS</p> <ul style="list-style-type: none"> • WB SR-91 upstream (east) of the Tustin Avenue interchange will worsen to LOS F in the a.m. peak and LOS E in the p.m. peak hour. The downstream LOS is projected to be LOS E in the a.m. peak hour and LOS C in the p.m. peak hour. <p>Purpose and Need</p> <ul style="list-style-type: none"> • Not consistent with the 	<p>Geometrics</p> <ul style="list-style-type: none"> • Widen bridge over the Santa Ana River to accommodate one additional lane. <p>Operation</p> <ul style="list-style-type: none"> • Alleviate existing weaving conditions. However, there would still be some weaving and merging. <p>LOS</p> <ul style="list-style-type: none"> • WB SR-91 upstream (east) of the Tustin Avenue interchange is projected to operate at LOS D in both the a.m. peak hour and the p.m. peak hour. The downstream LOS is projected to be LOS D in the a.m. peak hour and 	<p>Geometrics</p> <ul style="list-style-type: none"> • Widen bridge over the Santa Ana River to accommodate two additional lanes. <p>Operation</p> <ul style="list-style-type: none"> • Relieve weaving and merging conditions to a greater level than Alternative 2. <p>LOS</p> <ul style="list-style-type: none"> • WB SR-91 upstream (east) of the Tustin Avenue interchange is projected to operate at LOS C in both the a.m. peak hour and the p.m. peak hour. The downstream LOS is projected to be LOS C in both the a.m. peak hour and the p.m. peak hour.

Table 1.14 Comparison of Alternatives and Impacts

Evaluation Criteria	No Build Alternative (Alternative 1)	Alternative 2	Alternative 3
	<p>project purpose and need, and the FTIP.</p> <p>Santa Ana River Trail</p> <ul style="list-style-type: none"> No impacts to recreational trails under the No Build Alternative. 	<p>LOS C in the p.m. peak hour. Traffic delays would occur during construction.</p> <p>Purpose and Need</p> <ul style="list-style-type: none"> Will be consistent with the project purpose and need and the FTIP. <p>Santa Ana River Trail</p> <ul style="list-style-type: none"> Detour the Santa Ana River Trail for up to 4 months during construction. 	<p>Traffic delays would occur during construction.</p> <p>Purpose and Need</p> <ul style="list-style-type: none"> Will be consistent with the project purpose and need and the FTIP. <p>Santa Ana River Trail</p> <ul style="list-style-type: none"> Detour the Santa Ana River Trail for up to 4 months during construction.
Visual and Aesthetics	<ul style="list-style-type: none"> No Change 	<ul style="list-style-type: none"> Removal of ruderal and ornamental vegetation within the project footprint. 	<ul style="list-style-type: none"> Removal of ornamental and ruderal vegetation within the project footprint. Increase the urban elements by constructing a retaining wall at the Riverdale Avenue overcrossing, and by providing an additional and separate connector lane around the existing connector.
Water Quality and Storm Water Runoff	<ul style="list-style-type: none"> No Change 	<ul style="list-style-type: none"> Require work within the Santa Ana River, and the river will need to be diverted during construction. A dewatering plan would be required. Impervious surface area increase of 0.85 acres. 	<ul style="list-style-type: none"> Require work within the Santa Ana River, and the river will need to be diverted during construction. A dewatering plan would be required. Impervious surface area increase of 2.87 acres.
Noise	<ul style="list-style-type: none"> No Change 	<ul style="list-style-type: none"> There would be a temporary increase in noise levels during the construction phase of the project. 	<ul style="list-style-type: none"> There would be a temporary increase in noise levels during the construction phase of the project.
Recreation Facilities	<ul style="list-style-type: none"> No Change 	<ul style="list-style-type: none"> Temporary detour of the Santa Ana River Trail of up to 4 months during construction. 3,078.35 sq ft of private recreational land adjacent to Little Warner Basin would be permanently acquired. 	<ul style="list-style-type: none"> There would be a temporary detour of the Santa Ana River Trail of up to 4 months during construction. 9,667.65 sq ft of private recreational land adjacent to Little Warner Basin would be permanently acquired.

Table 1.14 Comparison of Alternatives and Impacts

Evaluation Criteria	No Build Alternative (Alternative 1)	Alternative 2	Alternative 3
Biological Resources	<ul style="list-style-type: none"> The No Build Alternative will not result in impacts to biological resources. 	<ul style="list-style-type: none"> Requires work within the Santa Ana River to construct additional piers required to widen the SR-91 bridge over the river. During construction there is the potential for temporary impacts to nesting birds protected under the MBTA, and bats. Permanently impact 0.37 ac and 0.17 ac of CDFG and Corps jurisdictional areas, respectively. CWA Sections 401 and 404 and Section 1602 permits will be required. 	<ul style="list-style-type: none"> Requires work within the Santa Ana River to construct additional piers required to widen the SR-91 bridge over the river. During construction there is the potential for temporary impacts to nesting birds protected under the MBTA, and bats. Permanently impact 0.86 ac and 0.43 ac of CDFG and Corps jurisdictional areas, respectively. CWA Sections 401 and 404 and Section 1602 permits will be required.
Air Quality	<ul style="list-style-type: none"> Air quality would likely deteriorate as a result of the anticipated increase in traffic volumes and idling vehicles. 	<ul style="list-style-type: none"> Temporary construction-related emissions. Following project construction, air quality is anticipated to improve as a result of improved traffic LOS and reduced vehicle idling time. 	<ul style="list-style-type: none"> Temporary construction-related emissions. Following project construction, air quality is anticipated to improve as a result of improved traffic LOS and reduced vehicle idling time.
Cultural Resources	<ul style="list-style-type: none"> No impacts to cultural resources are anticipated. 	<ul style="list-style-type: none"> No impacts to cultural resources are anticipated. 	<ul style="list-style-type: none"> No impacts to cultural resources are anticipated.
Cost	<ul style="list-style-type: none"> There would be no construction and no final design and construction costs. 	<ul style="list-style-type: none"> The estimated cost to construct Alternative 2 is \$12.7 million 	<ul style="list-style-type: none"> The estimated cost to construct Alternative 3 is \$24.3 million

CWA = Clean Water Act
 LOS = level of service
 MBTA = Migratory Bird Treaty Act
 NB = northbound
 PCE = permanent construction easement
 RTIP = Regional Transportation Improvement Program
 sq ft = square feet
 SR-55 = State Route 55
 SR-91 = State Route 91
 TCE = temporary construction easement
 WB = westbound

1.6 Alternatives Considered But Eliminated From Further Discussion

The analysis of the proposed project provided a comprehensive study of design solutions that were considered for addressing the need for improvements along the subject connector between NB SR-55 and WB SR-91. The transportation concepts discussed below were evaluated and eliminated from further consideration based on impacts to resources, feasibility, operational deficiencies, inability to meet the project purpose and need, and/or cost.

1.6.1 Alternative 4 (Braided Configuration)

As presented in the approved Project Study Report (August 2004), Alternative 4 is a braided configuration between the NB SR-55 to the WB SR-91 connector and the Tustin Avenue off-ramp.

The existing SR-91 LOS is LOS E upstream and LOS D downstream for the am peak hour and LOS D upstream and LOS C downstream for the pm peak hour. The Alternative 4 Year 2015 SR-91 LOS is forecast to be D upstream and C downstream for the am peak hour and C upstream and C downstream for the pm peak hour. The Alternative 4 Year 2035 SR-91 LOS is forecast to be E upstream and D downstream for the am peak hour and C upstream and C downstream for the pm peak hour.

For the Project Approval/Environmental Document (PA/ED) Phase, Alternative 4 was removed from further consideration by the Project Development Team for the following reasons:

- Alternative 4 would involve substantial ROW acquisitions, including full and partial acquisitions; TCEs and PCEs; and approval of numerous nonstandard design features that could affect motorists' safety.
- This alternative includes substantially more construction of new structures, has the greatest potential environmental impact of all the studied alternatives, and introduces new operational problems discussed below.
- This alternative relocates the merging of the two lane NB SR-55 connector to the WB SR-91 to a point immediately east of the Tustin Avenue overcrossing. At this location, 3,330 peak hour vehicles are merging to the WB SR-91, while at the same time, one of the two connector lanes is being dropped. This is forecast to result in a worse year 2035 am peak hour upstream operational level of service for Alternative 4 (LOS E) compared to LOS D for Alternative 3. Therefore,

- Alternative 4 would not result in the best possible LOS improvement at the NB SR-55 to WB SR-91 connector through the Tustin Avenue interchange.
- Alternative 4 would eliminate the weaving between Northbound 55 to Westbound SR-91 Connector and the Westbound SR-91 to Tustin Ave off-ramp. This alternative would create a new bottle neck downstream of the Tustin Avenue overcrossing. Therefore, this alternative would create a new operational deficiency and would not meet the project purpose and need of removing a chokepoint and eliminating future operational deficiencies.

1.6.2 Tustin Overcrossing Replacement

Replacement of the Tustin Avenue overcrossing structure was included in the Build Alternatives evaluated in the PSR to provide additional travel lanes with standard lane and shoulder widths under the overcrossing. Replacement of the overcrossing would have also required improvements to the NB and southbound (SB) approaches on Tustin Avenue. Subsequently, a Value Analysis Study was conducted for this project in June 2009. The Value Analysis results are documented in the *Value Analysis Report, D-12 SR-91 from Northbound SR-55 to Tustin Avenue*, prepared by Value Management Strategies, Inc. in August 2009. During the Value Analysis, it was discussed that as part of the Renewed Measure M program, OCTA is developing a future SR-91 widening project that is anticipated to widen the SR-91 mainline along a defined section of SR-91, including through the project limits. The extent of the SR-91 widening is not defined at this time, and as such, it cannot be determined how the Tustin Avenue overcrossing should be configured to accommodate the future SR-91 project. The Value Analysis team concluded that it is appropriate for the future SR-91 widening to replace the Tustin Avenue overcrossing, and the associated Tustin Avenue improvements and these project features were removed from the Build Alternatives.

1.6.3 Transportation System Management (TSM) and Transportation Demand Management (TDM) Alternatives

Alternative travel modes were considered during the early planning studies. Transportation System Management (TSM) strives to maximize the efficiency of the existing system through operational modifications by providing options such as ridesharing, reversible lanes, ramp metering, and traffic signal optimization. TSM strategy options consist of actions to improve traffic flow and increase the number of vehicle trips without altering the number of through lanes, while Transportation Demand Management (TDM) focuses on the demand side of travel behavior, with regional strategies for reducing the number of vehicle trips and vehicle miles traveled

and increasing vehicle occupancy. It facilitates higher vehicle occupancy or reduces traffic congestion by expanding the traveler's transportation choices through initiatives such as telecommuting and changing work schedules to produce a more even pattern of transportation network use, thereby muting the effect of morning and evening rush hours. Multimodal alternatives integrate multiple modes of transportation, such as pedestrian, bicycle, automobile, rail, and transit.

There are existing TSM and TDM strategies within the vicinity of the project area. As discussed earlier in this chapter, there are several forms of alternate transportation and corresponding programs available to residents living within the project area. A Metrolink station, bus routes, Park and Ride facilities, and rideshare programs are available for general public use.

Although Transportation System Management measures alone could not satisfy the purpose and need of the project, the following Transportation System Management measures have been incorporated into the Build Alternatives for this project: auxiliary lanes, ramp metering, and traffic signal optimization.

TSM, TDM, and multimodal alternatives alone do not satisfy the proposed project's purpose of improving both existing and future mobility, reducing congestion, and improving mainline weaving, merge, and diverge movements, and would not fulfill OCTA's Freeway Chokepoint Program. Therefore, TSM or TDM alternatives were not formally developed for the proposed project.

1.7 Permits and Approvals Needed

Table 1.15 lists the permits, reviews and approvals that would be required for construction of the proposed project.

Table 1.15 Required Permits, Reviews, and Approvals

Agency	Permit/Approval	Status
ACOE	Section 404 Permit for filling/dredging waters of the United States	The Department to obtained during Design Phase
CDFG	1602 Lake or Streambed Alteration Agreement	The Department to obtained during Design Phase
SARWQCB	Section 401 Water Quality Certification	The Department to obtained during Design Phase
SARWQCB	Waste Discharge Requirements (WDRs) For Construction site Dewatering (De Minimus) (NPDES CAG998001)	The Department has been issued NPDES CAG998001
SWRCB	Section 402 NPDES: Department NPDES Permit CAS000003 and CAS000002 (Construction Activity/General Permit)	The Department has been issued NPDES Permit CAS000003. NPDES Permit CAS000002 (General Permit) To obtained during Design Phase
OCFCD	Encroachment Permit	The Department is to obtain letter or permit
OCWD	Permit for work within the recharge basins	The Department to obtained during Design Phase

ACOE = United States Army Corps of Engineers
 CDFG = California Department of Fish and Game
 Department = California Department of Transportation
 NPDES = National Pollutant Discharge Elimination System
 OCFCD = Orange County Flood Control District
 OCWD = Orange County Water District
 SARWQCB = Santa Ana Regional Water Quality Control Board
 SWRCB = State Water Resources Control Board

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